E5897 B2
2. Translation of
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[SCOPE OF CLAIM FOR PATENT]

[Claim 1]

A teleconference system for communication of information including dynamic image between distant terminal units exchanging information relating to presence or absence of image and size to be transmitted from a counterpart terminal and varying compression ratio of the image to be transmitted depending upon a image display size at the counterpart terminal.

[Claim 2]

A teleconference system as set forth in claim 1, wherein image is not displayed at said counterpart terminal, transmission of image is interrupted.

[Claim 3]

A terminal unit exchanging information including dynamic image with a counterpart terminal connected through a communication circuit, receiving information relating to display size at said counterpart terminal of an image to be transmitted and transmitting the image with compression according to a compression condition depending upon said display size.

[Claim 4]

A terminal unit as set forth in claim 3, wherein when image id not displayed in said counterpart terminal, transmission of image is interrupted.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[Field of the Invention]

The present invention relates to a teleconference system and a terminal unit.

[0002]

[Prior Art]

Recently, a video camera which can be connected to a computer has become available at low price to realize teleconference between computers using the video and data relatively easily. In such teleconference system, on the screen of the computer, a window displaying an image from the communication counterpart and a window for data conference are set separately. It is typical that these window, particularly data conference window is freely variable of its size.

[0003]

[Problem to be Solved by the Invention]

In the prior art, on the limited same screen, an image window and the data conference window are displayed together. Therefore, upon conference centered at data conference, the image window becomes hindrance. Normally, use closes the image window to progress the conference using voice and data conference window. However, even during this period, the encoded image data is transmitted on the circuit to lower use efficiency

of the circuit.

[0004]

The present invention solves such problem, and an object is to propose a teleconference system and a terminal unit with improved circuit use efficiency.

[0005]

[Means and Effect for Solving the Problem]

In the present invention, between distant terminal units information relating to presence or absence of image and size is exchanged. Then, compression ratio of the image to be transmitted is varied depending upon a image display size at the counterpart terminal. In extreme case, when image is not displayed at said counterpart terminal, transmission of image is interrupted.

[0006]

By thus, a ratio of a transmission medium to be occupied by the image data can be varied adapting to actual use to significantly improve circuit use efficiency.

[0007]

[Mode for Implementing the Invention]

Hereinafter, with reference to the drawings, the embodiment of the present invention will be discussed in detail.

[0008]

Fig. 1 is a schematic constructional block diagram of

one embodiment of a terminal according to the present invention. The reference numeral 10 denotes a system control circuit controlling communication between an overall terminal and a counterpart terminal, 12 denotes a camera as an image input means, 14 denotes a cameral signal processing circuit processing an output signal of a camera, 16 denotes a camera control circuit controlling a camera 12 and a camera signal processing circuit 14, 18 denotes an image encoding and decoding circuit which encodes an image signal from the camera processing circuit 14 and decodes encoded image (normally, the image from the counterpart terminal), and 20 denotes an expanding and contracting circuit for expanding and contracting the image signal decoded by the image encoding and decoding circuit 18 into an arbitrary display size.

[0009]

The reference numeral 22 denotes a microphone as a voice input means, 24 denotes a speaker as a voice output means, 26 denotes a voice encoding and decoding circuit for encoding a voice signal and decoding the encoded voice signal (normally, voice signal from the counterpart terminal).

[0010]

The reference numeral 28 denotes a multiplexing and separating circuit supplying the encoded image signal from the image encoding and decoding circuit 18, the encoded voice signal

from the voice encoding circuit 26 and data and control signal from the system control circuit 10 to a network interface 30 with multiplexing, and separating reception information from the network interface 30 to supply the encoded image signal to the image encoding and decoding circuit 18, the encoded voice signal to the voice encoding and decoding circuit 26 and other data to the system control circuit 10. The network interface 30 becomes an interface with a data transmission circuit, such as a public circuit or the like.

[0011]

The reference numeral 32 denotes a monitor (CRT or a liquid crystal display panel) for displaying an image, 34 denotes a display processing circuit for providing process for display for information from the system control circuit 10, information fed from the expanding and contracting circuit 20 via the system control circuit 10, 36 denotes an operation device (keyboard, switch or the like, and a mouse or the like) for inputting various command to the system control circuit.

[0012]

Operation of the shown embodiment will be discussed.

[0013]

At first, flow of encoding of the image and voice will be discussed. The camera signal processing circuit 14 provides an adjustment process, such as exposure, white balance or the

like for the image signal from the camera 12 to apply to the image encoding and decoding circuit 18. The image encoding and decoding circuit 18 encodes the image signal from the camera signal processing circuit in a known manner. On the other hand, the voice encoding and decoding circuit 26 also encodes the voice signal from the microphone 22 in the known matter. The image signal encoded by the image encoding and decoding circuit 18, the voice signal encoded by the voice encoding and decoding circuit 26 are applied to the multiplexing and separating circuit 28. To the multiplexing and separating circuit 28, data and control information from the system control circuit 10 is applied. The multiplexing and separating circuit 28 multiplexes these data. The multiplexed data is transmitted to the counterpart terminal through the network interface 20 and the public circuit network.

[0014]

The information transmitted from the counterpart terminal is processed as follow. Namely, the information from the counterpart terminal is input to the multiplexing and separating circuit 28 via the network interface 30 and is separated into the encoded image data, the encoded voice data and the communication data (including the control data). They are respectively supplied to the image encoding and decoding circuit 18, the voice encoding and decoding circuit 26 and the system

control circuit 10.

[0015]

The voice encoding and decoding circuit 26 applies the encoded voice data from the multiplexing and separating circuit 28 is decoded and applied to the speaker . By this, the voice from the counterpart terminal is output from the speaker 24.

[0016]

The image encoding and decoding circuit 18 decodes the encoded image data from the multiplexing and separating circuit 28 to apply to the expanding and contracting circuit 20. To the expanding and contracting circuit 20, the information relating to the display position and the display size on the display screen of the received image is also supplied from the system control circuit 10. The expanding and contracting circuit 20 expands and contracts the received image from the image encoding and decoding circuit 18 according to designation of the display size, and output at a timing depending upon the designated display position. The system control circuit 10 supplies the image signal from the expanding and contracting circuit 20 to the display processing circuit 34 as is, and in conjunction therewith supplies other information to be displayed to the display processing circuit 34. The display processing circuit 34 converts the signal adapted to the monitor 32 to supply to the monitor 32.

[0017]

In the shown embodiment, between the terminals, the information of the display size and presence and absence of display is exchanged. The system control circuit 10 controls the image encoding and decoding circuit 18 and the multiplexing and separating circuit 28 to adjust the data amount of the image information to be transmitted and transfer rate for the image. The transfer rate assigned for the image is varied. Normally, by erasure, the compression rate in the image encoding and decoding circuit 18 is varied. In extreme case, when the image transmitted from own side is not displayed, image transmission is interrupted.

[0018]

[Effect of the Invention]

As can be easily appreciated from the foregoing discussion, by the present invention, the image transmission depending upon use mode of the transmitted image is controlled, and when the image is not displayed on the counterpart, image transmission is interrupted to enhance use efficiency of the circuit.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[Fig. 1]

A schematic block diagram showing a construction of one embodiment of the present invention.

[EXPLANATION OF REFERENCE NUMERALS]

10: system control circuit

12: camera

14: camera signal processing circuit

16: camera control circuit

18: image encoding and decoding circuit

20: expanding and contracting circuit

22: microphone

24: speaker

26: voice encoding and decoding circuit

28: multiplexing and separating circuit

30: network interface

32: monitor

34: display processing circuit

36: operation device

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